Tree Book

Learning to Recognize Trees of British Columbia

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Tree Book

Our vast green forests are British Columbia's greatest natural resource.

To quietly walk among the trees, to hear the sounds, to see the colours and the shapes, to breathe the clean fresh air is to experience the forest, its peace and its solitude.

The next time you enter a forest, think of all the trees. Think of their importance—not just to you—but to all life.

Trees provide shade on a warm summer's day, they protect our fish spawning grounds, and by breaking the wind they help conserve valuable moisture. Home for much of our wildlife, trees are the basis of our large watershed areas and other fresh water sources. Available for a wide variety of recreational activities, our forests also produce enormous quantities of life-giving oxygen.

Although British Columbia has about fifty different kinds of trees, in this booklet we study the principal commercial species.

Our foremost objective is to provide you with a quick, easy and interesting method of tree identification; and at the same time give you some idea of the trees' uses, location and history.

G.C.

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What To Look For

Learning to recognize trees is not always easy, because some trees look very much alike.

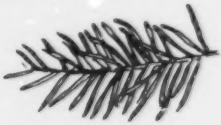
The most common and effective way to identify a tree is to closely examine one of its leaves or a branch of its needles.

When looking at leaves or needles, ask yourself these questions:

Do the leaves consist of tiny overlapping scales? If they do, are they sharp or rounded?

Are the needles joined to the tree's branch in bundles? If they are, how many needles are there in each bundle? Are the needles soft or hard?

Are the needles joined to the tree's branch singly? How easy does a needle roll between your fingers? Is the needle stiff, sharp, soft, hard, dull or notched? Are the needles straight, curved, equal or unequal? Are the needles in rows, or do they stand out from all around the stem?



If the needles join the tree singly, are they blunt or notched at the tips? If so, are the cones located near the top and do they stand upright?

If looking at leaves, do they have coarse lobes and radiating veins? Or, do they have broad leaves with fine or coarse teeth?

Western Red-Cedar *Thuja plicata*

Western red-cedar, is a massive, durable tree of conical form with a flared base. In good moist sites it can reach a height of 60 m with a diameter of 2 m or more.

Older trees often have dead tops and may be dense enough to hide the trunk.

This species is one of the most important timber producers of the province because of its resistance to decay. It is used for shakes, shingles, poles, posts, window sashes, millwork and interior finishing. The wood is very light, soft, straight-grained but with relatively low strength.

West Coast Indians valued western red-cedar bark highly, for making baskets, clothes and mats. The reddish fragrant wood was also used by the Indians for canoes and lodges.

Location

This tree grows in moist soils from sea level to altitudes close to 2 100 m. However, at levels above 1 350 m growth is reduced and the tree more resembles a shrub. The best growth is on old river or creek beds, but the tree may be found in shallow moss bogs or in drier locations on rich soils.

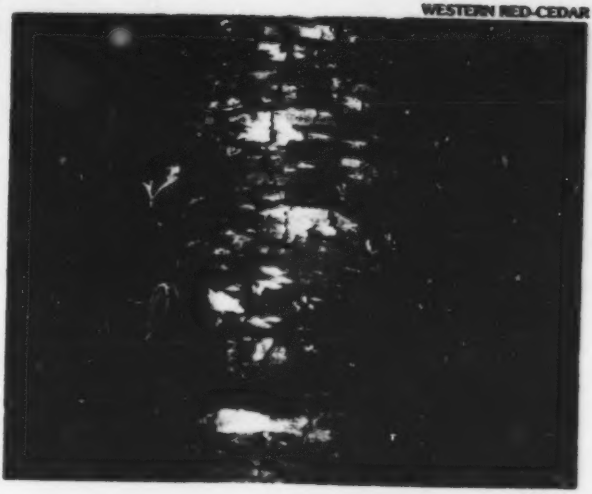
WESTERN RED-CEDAR

Cones

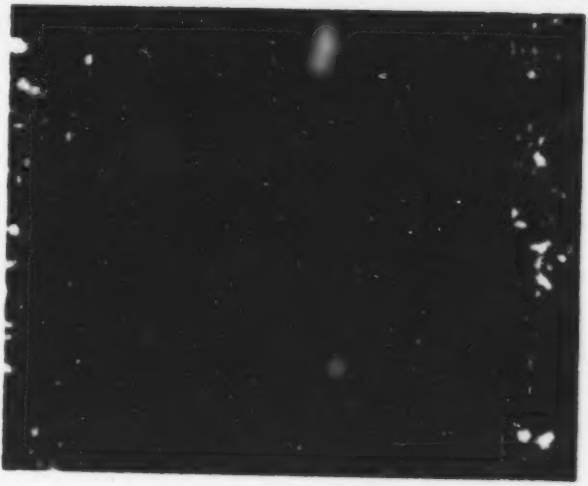
Western red-cedar seeds are borne in cones, which are clustered near the branch ends. The small, brown cones are oval, about 1-2 cm long with tough leathery scales, bearing double-winged seeds nearly 6 mm long. The cones ripen in late summer, shedding the following year. Cone-scales often have minute, weak, sharp points on their backs near the tips.

Leaves

Twigs of this tree form in narrow, tapering sprays that droop from the branches. The aromatic leaves are scale-like and flattened, bright glossy green, arranged on slender twigs in flat, fan-like sprays. During early winter or late fall, the inner foliage of western red-cedar usually turns brown and dies.



YOUNG



MATURE

Bark

The thin, reddish-brown bark is fibrous, stringy, and usually less than 25 mm thick. On large trunks, the bark forms interlacing ridges.

Yellow-Cedar (Cypress)

Chamaecyparis nootkatensis

A medium-sized tree, 18-24 m tall, about 60-90 cm in diameter, yellow-cedar has a broad trunk, and a sharply conical crown of spreading and dropping branches. The tip of the crown is often bent over. The wood is light, hard and strong, close-grained and even-textured. It is used in boat building, greenhouse construction, and almost anywhere resistance to decay is required. This species grows so slowly it often requires over 200 years to reach a marketable size.

Location

Yellow-cedar is usually found at high elevations on the coast, although north of Knight Inlet it does grow down to sea level. Near the ocean it is found in deep, moist soil growing singly, or in small clumps mixed with other conifers.

YELLOW-CEDAR

YELLOW-CEDAR

Cones

The cones are round and small, about 6-12 mm in diameter when mature at the end of the second season. They have four to six umbrella-shaped thick scales. Seeds have two lateral wings about twice as wide as the seeds.

Leaves

Twigs of the yellow-cedar are slender, four-sided and are unpleasant to touch because of the sharp spreading leaf-tips. The scale-like leaves are bright glossy green, 3-6 mm long and pointed.

YELLOW-CEDAR

YOUNG

MATURE

Bark

Thin, greyish-brown and more papery than the stringy bark of the red-cedar, it is scaly on young trees and has narrow intersecting ridges on mature trunks.

Lodgepole Pine *Pinus contorta*

There are two forms of this species: a short, scrubby, often crooked tree growing in a relatively narrow band along the coast of British Columbia; and an inland tree that is tall, slender and straight. It is the inland form that is an important timber-producing tree used in general construction, siding and pulp.

Preservative-treated it is used for railway ties, poles and mine timbers. While the coast variety reaches heights of only 4-15 m, and diameters of 30-45 cm, the inland variety is often 15-30 m tall with diameters up to 60 cm. Native Indians boiled the inner bark for food, and used this tree for wigwam poles.

Location

Lodgepole pine grows on a wide variety of sites from gravelly and stony ridges to swamps and coastal dunes, but it grows best on well-drained loams that are moist and light. The inland form grows at elevations from 450 m to 3 450 m.

Cones

Lodgepole pine produces some seed virtually every year and has abundant crops at one to three year intervals. The cones vary in shape from short and cylindrical to egg-shaped, 2-5 cm long, without stalks. The scales thicken at the tips and have curved prickles that may be shed. The cones usually remain closed when mature, but may open in the autumn. The seeds are about 4 mm long, brownish, mottled, and are ridged on one side. The seed-wing is about 1 cm long.

Needles

The twigs are orange or reddish-brown or nearly black; buds about 6 mm long, resinous, and reddish-brown. The needles are formed in pairs, 2-7 cm long, and are often spirally twisted, stiff, very sharp-pointed, dark green to yellowish green.

LODGEPOLE PINE

YOUNG

MATURE

Bark

The bark on lodgepole pine trees on the coast becomes deeply furrowed into dark reddish-brown plates 2-3 cm thick. On inland trees it is about 1 cm thick, orangy-brown to grey, and finely scaled.

Ponderosa Pine (Yellow pine)

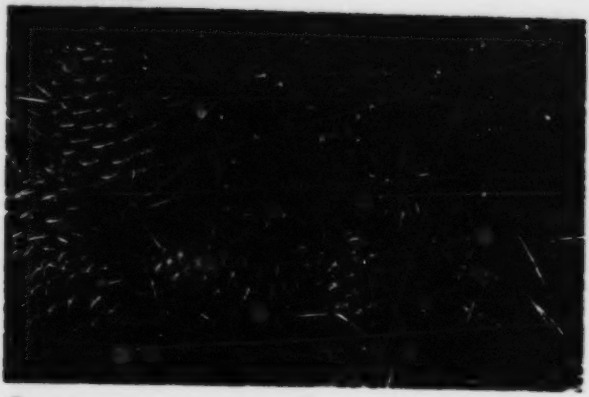
Pinus ponderosa

A large-crowned tree with straight trunk showing little taper, the ponderosa pine is often clear of branches for most of its length. Under very favourable conditions they may reach heights of 50 m and diameters up to 2 m although heights of 22-30 m, and diameters up to 1 m are more normal. The wood is light, fairly strong, yellowish to reddish-brown and moderately resistant to decay. It is used for sashes, frames, mouldings, panelling, cabinet work, boxes and crates.

Location

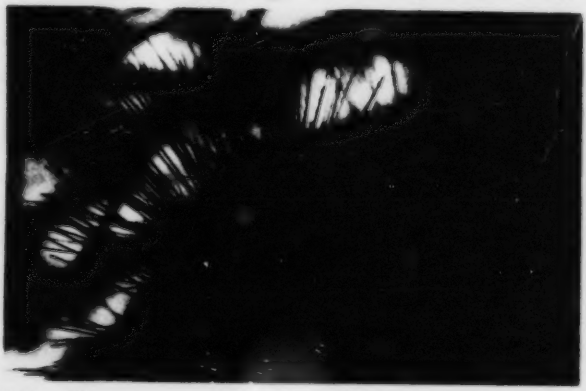
Growing on a variety of soils from extremely dry to well-drained, relatively deep, moist soils, ponderosa pine forms pure, open, park-like stands down to altitudes of 300 m, but also grows with other species at altitudes up to 1 200 m.

PONDEROSA PINE



Cones

The cones, about 7-15 cm long, are cylindrical and narrow when closed. The scales thicken at the tips and bear sharp rigid prickles. The cones open when mature in the autumn, and have usually fallen by spring. The seeds are 6 mm long with an 18 mm long terminal wing.

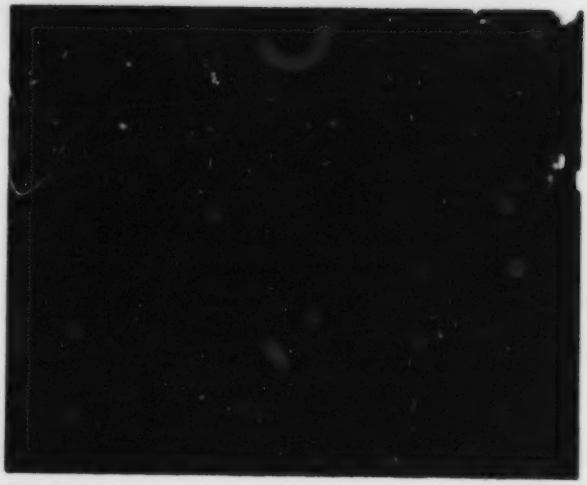


Needles

The needles, usually a dark yellowish-green colour, are generally over 12 cm long, and grow in clusters of three. Ponderosa pine twigs are stout, hairless, yellowish-green changing to orange.

PONDEROSA PINE

YOUNG



MATURE

Bark

On young trees, the bark is blackish, rough and scaly. On mature trees it is bright orangy-brown, deeply fissured into flat, ridge-like plates.

Western White Pine *Pinus monticola*

A large tree up to 60 m high, found on Vancouver Island and the nearby mainland coast, the western white pine also grows in the wetter parts of the interior. The wood is light, moderately low in strength, creamy-white to yellow. It is used for a great variety of trim and finishing products, crates, and wooden matches. Generally, when growing in the open, the western white pine has a slender column-like crown with short, conspicuously whorled branches. In closed stands it has a short, open, usually symmetrical crown with a trunk often free of branches up to 30 m from the ground, showing little taper. Western white pine is often easily identified by its association with an infectious disease called White Pine Blister Rust, which causes portions of the tree to turn an orange-brown colour and die. It is now evident that this species will not remain a tree of commercial importance unless the rust is controlled.

Location

Western white pine thrives on a variety of soils ranging from peat bogs to dry sandy and rocky earth but makes its best growth on the fertile well-drained soils in moist valleys, and on gentle slopes with northern exposures.

Cones

The cones, which mature late in summer and fall during the winter or early spring, are cylindrical when closed, about 1-25 cm long. Some 90 to 160 scales open when the cone dries out. The scales are arranged in seven to nine spiral rows. The seed wing is about 3 cm long.

Needles

The needles are 5-10 cm long, appearing in bundles of five. They are slender, straight, moderately flexible and soft to touch. Bluish-green, the needles also have a whitish bloom. The edges are very finely toothed.

YOUNG

MATURE

Bark

Thin, smooth, and greyish-green on young trees, turning dark grey, nearly black on older trunks. The bark is broken into small, rectangular scaly plates separated by deep crevices.

Western Larch *Larix occidentalis*

The most important of the larches, the western larch is a prime timber-producing tree. The wood is used mainly in building construction, for railway ties, pilings, flooring, and interior and exterior finishing as well as for pulp. When in a stand, the western larch develops a long, tapering, branch-free trunk to heights between 30-50 m with a trunk averaging 120 cm diameter. Open-grown trees retain foliage to within 1 m from the ground, but have open crowns.

Location

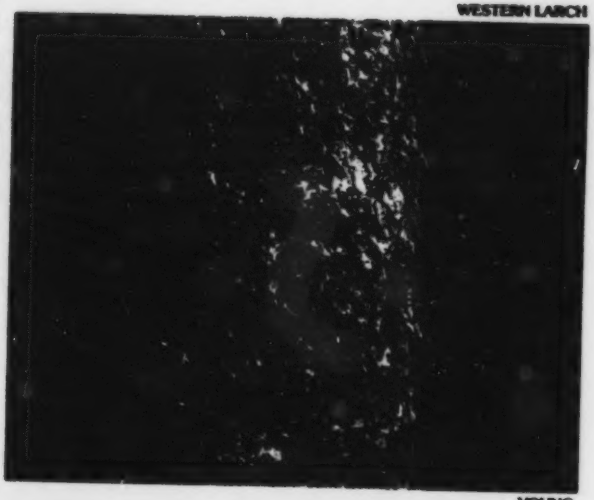
Western larch grows at altitudes between 420-1 200 m, mainly in the southern part of the Columbia Forest Region and adjacent Montane Forest Region. Best growth is made on deep, porous, moist soils. Though there are some pure stands it is more often mixed with other species. The western larch is intolerant of shade; a deep wide-spreading root system makes the tree quite windfirm.

Cones

The cone is oval when closed, somewhat egg-shaped when open, 25-40 mm long on a short, stout curved stalk. Cone scales bend slightly downward when fully open, and are covered with whitish hairs below. Bracts with long slender points extend straight out beyond the scales. The seeds are 5 mm long and have a wing about 8 mm long.

Needles

Pale yellow-green, changing to yellow-orange in the autumn, the needles are 25-36 mm long and are slender, soft and flexible. They are spirally arranged, appearing in clusters of 16 to 30 on short spurs. The western larch is the only cone-bearing tree to lose its needles in autumn. The branches extend above the horizontal and have unswept tips.



YOUNG

MATURE

Bark

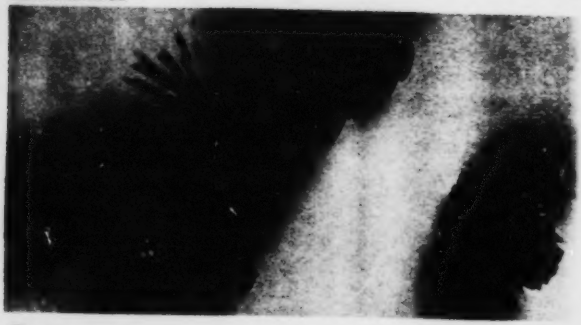
On young trees, the bark is reddish-brown and scaly. This becomes deeply furrowed into flaky ridges on mature trunks and is up to 7-15 cm thick.

Black Spruce *Picea mariana*

Essentially a swamp or bog species found mainly in central and northern British Columbia, black spruce is very common along the Alaska Highway. The tree is short, 15-20 m tall, stiff-branched with a dense knobby crown. On many trees, cone-clipping by squirrels, combined with very slow branch growth gives the top a compact club-like shape. The long fibres in black spruce make this tree a favoured pulpwood for the manufacture of facial tissues and other paper products.

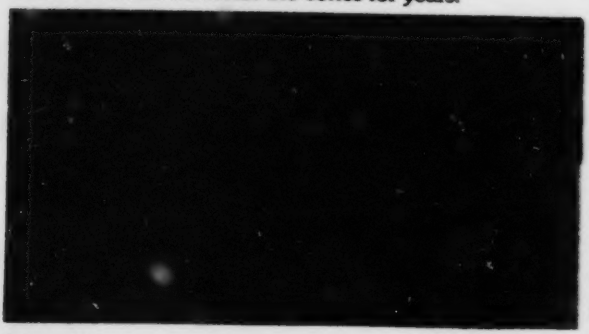
Location

In the south, black spruce is generally confined to moss bogs, while further north it often grows on well-drained slopes and flats. It is found from sea level to 1 800 m elevation; from dry sands and gravels to perpetually wet bogs and swamps. It has an advantage over many species in that it can reproduce from seed and also by 'layering'—the lower branches on becoming covered by moss or litter develop roots, and the branches eventually become new trees.



Cones

The purplish cones are short, almost spherical when open and last for several years. They are about 25 mm long with close-fitting scales that open at intervals to release the seeds gradually throughout the winter. Some seeds are retained within the cones for years.

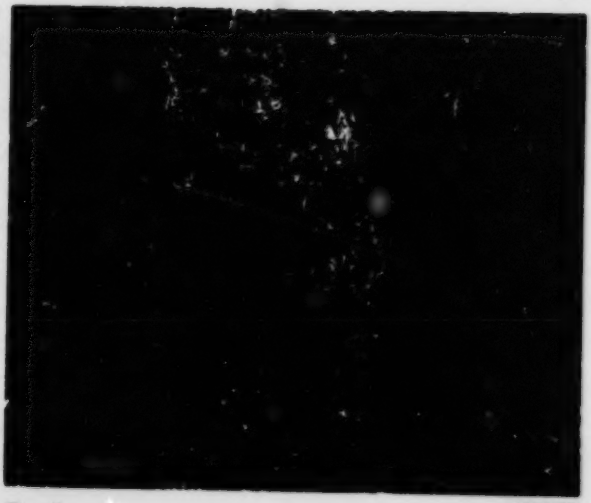


Needles

The needles are stiff, blunt, four-sided, and about 12 mm long. When they emerge from the buds they are covered with a whitish bloom which later disappears, leaving them a dark bluish-green. The needles grow on twigs from peg-like projections, a characteristic feature of spruce. The reddish-brown twigs are covered with fine hairs. The buds are covered with greyish scales which have long, slender points projecting well beyond the tip of the bud.

BLACK SPRUCE

YOUNG



MATURE

Bark

The scaly bark is dark greyish-brown on the outside, deep olive-green on the inside.

Sitka Spruce *Picea sitchensis*

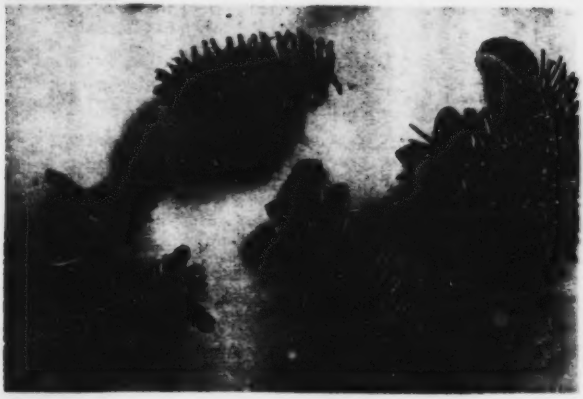
This is the largest of our spruces, and produces wood of high commercial value. Larger than any other spruce in North America, or perhaps in the world, its size is comparable to the huge Douglas-fir, 37-52 m in height, and over 2 m in diameter. However, trees up to 84 m high and 4 m in diameter have been reported. Characteristic of the Sitka spruce are the many branchlets drooping from the long, thin, main horizontal branches. The light, soft, resilient, relatively strong long fibred wood is used in general construction, ship building, plywood, boxes, crates, sounding boards for musical instruments, and pulp.

West Coast Indians made baskets and household articles from the pliable roots and smaller branches. Not too many years ago, Sitka spruce was used extensively in the aircraft industry.

Location

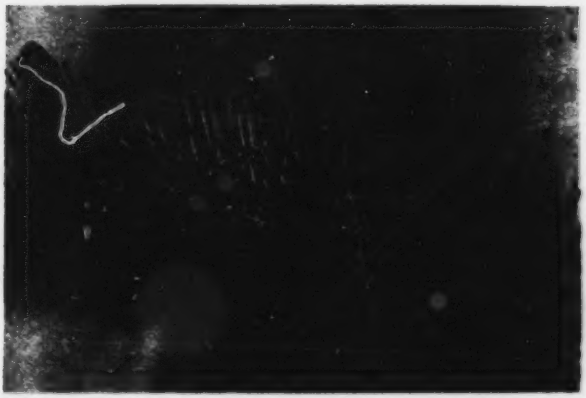
Sitka spruce is found on the coast at elevations up to 690 m. It grows best on deep, well-drained soils near streams, in pure stands and in mixture with other species.

SITKA SPRUCE



Cones

The cones are broad and cylindrical, 6-10 cm long, opening at maturity, they fall to the ground during late autumn and winter. They have a somewhat ragged array of thin wavy-edged scales.



Needles

The bluish-green needles are very sharp to the touch, about 25 mm long, appear flattened or diamond-shaped, and are difficult to roll between your fingers. They tend to radiate at right-angles from the twig.

SITKA SPRUCE

YOUNG

MATURE

Bark

Thin, broken into large reddish-brown scales. The inner bark is silvery-grey.

White Spruce *Picea glauca*

White spruce is one of the most important species in the British Columbia interior. Because Engelmann spruce and white spruce are almost indistinguishable, except for their cones, they are often both referred to as white spruce. Normally reaching a height of over 30 m, the white spruce has a uniform conical crown, with upper branches appearing to sweep upwards, while lower branches droop.

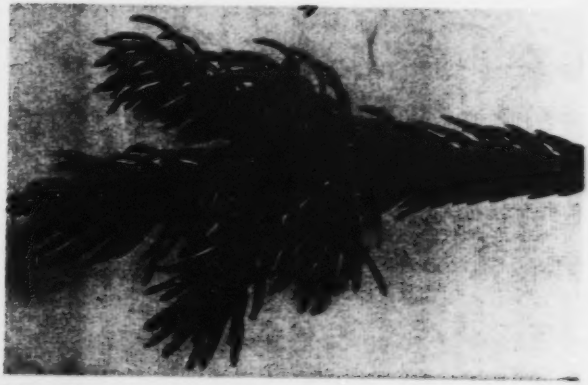
The light, soft, straight-grained wood has extra long fibres, making it particularly valuable to the pulp and paper industry.

Location

White spruce grows in a variety of soils and climates with best examples found along streams, or in mixed stands on well-drained but moist, silty soils.

Cones

About 5 cm long, white spruce cones are slender, cylindrical, with stiff, roundish, close-fitting, light-brown scales. (Engelmann spruce cones are more oval, yellowish-brown and have rather prominent bracts.) The cones open in the autumn and fall to the ground during the winter or early spring.



Needles

About 2 cm long, white spruce needles are stiff, sharp, four-sided and easily rolled. They are bluish-green and quite aromatic when crushed.

WHITE SPRUCE

YOUNG

MATURE

Bark

The bark is thin, scaly and pale greyish-brown.

Douglas-Fir *Pseudotsuga menziesii*

Our largest cone-bearing tree, rising to 85 m or more on good coastal sites and up to 42 m in the interior, the Douglas-fir has made British Columbia world famous as a timber producer. Used for building and construction purposes in the form of lumber, timbers, piling, and plywood, its value as a structure timber is due to its strength and stiffness combined with its moderate weight. Young Douglas-fir seedlings favour partial shade. Full sunlight or full shade causes many of them to die. Older trees are often attacked by the spruce budworm, Douglas-fir bark beetle, and other insects.

Location

Douglas-fir thrives under a wide range of soil and climatic conditions. On the coast it grows best in fairly deep, moist but well-drained soils in locations having at least 1 m of rainfall a year and a long growing season. The interior variety is confined to drier sites of the southern and central interior.

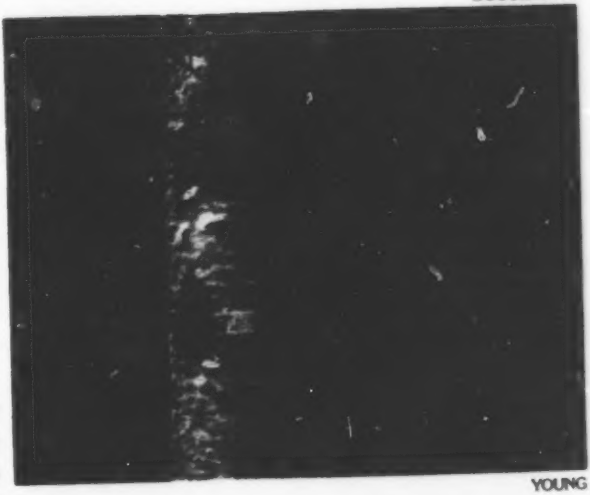
Cones

Douglas-fir cones, 5-11 cm long, are easily identified by the three-pronged bracts emerging below each scale.

Needles

The branches are generally horizontal, but the uppermost ones tend to curve upwards. The buds are brown, pointed and not prickly to the touch. The needles are of equal length, about 25 mm long, usually deep yellow-green. The needles are flattish, soft, narrow, slightly sharp, and usually appear to stand out from all around the stem.

DOUGLAS-FIR



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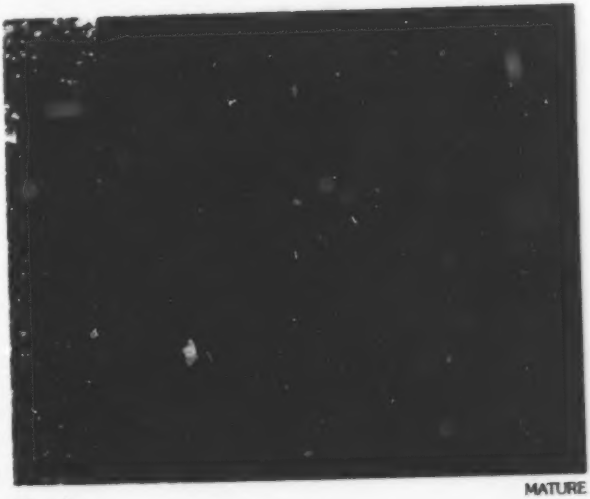


MATURE

Bark

Young trees have smooth grey-brown bark, covered with resin blisters. It later becomes thick, reddish-brown, with deep ridges.

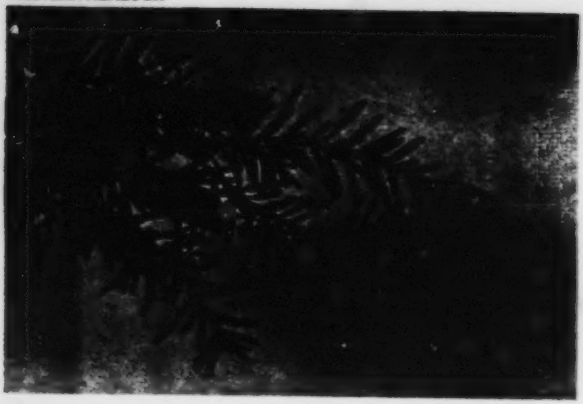
Western Hemlock *Tsuga heterophylla*

A tall tree, reaching 51 m on good coastal sites, the western hemlock has a long branch-free trunk. The top always droops, enabling the hemlock to be easily recognized from a distance. The light, fairly hard, whitish wood is used for interior finishes, boxes, crates, poles, broom handles and in general construction where durability is not a factor. Possibly its greatest use is in pulp manufacture, where it is a popular species. Early Canadian settlers named the hemlock after a European weed because of the similar odour when the needles are crushed.

Location

This trees grows on the coast, and in the interior wet belt up to 1 500 m altitude. It is often a dominant tree and seldom grows in pure stands. Young trees often start growing on the tops of stumps and fallen logs.

WESTERN HEMLOCK

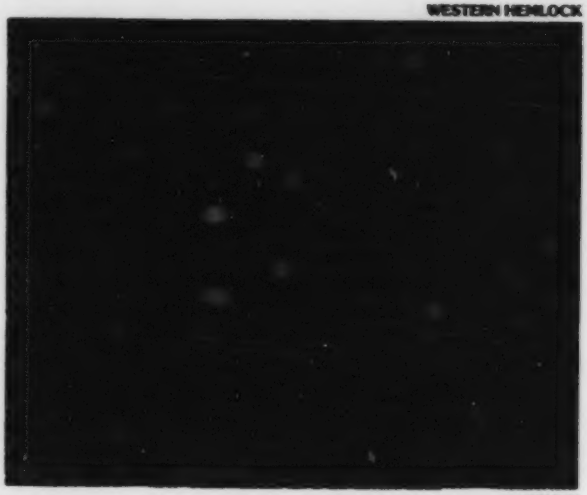


Cones

The cones are about 2 cm long, with scales narrow and rounded at the ends. The narrow-winged seeds are so small, about 2 mm long, that over 600,000 seeds weigh only one kilogram.

Needles

The needles, a glossy yellow-green, are flat, soft, blunt and of very unequal length, from 6 mm to 18 mm long. On the underside, there are two parallel white bands, running the full length of the needle.



YOUNG

MATURE

Bark

Young bark is russet-brown and quite scaly, becoming darker with maturity and deeply furrowed into flat-topped scaly ridges.

Mountain Hemlock *Tsuga mertensiana*

This species of hemlock varies from a low-spreading shrub-like form on exposed ridges at high elevations to a small tree—and even to a large tree growing in favourable situations. Usually it is from 8-16 m high, and from 25-30 cm in diameter. In the open it develops a strongly tapered trunk. The outline of the crown is narrowly conical. Usually the wood is marketed with western hemlock and, being moderately light, fairly hard and strong is used in general construction, for siding, flooring, plywood, railway ties, boxes and crates. It is also a valuable pulpwood species. The mountain hemlock shares the characteristic drooping tip of all hemlocks.

Location

Mountain hemlock is found in wet areas, at altitudes between 750-1 800 m, but descends into the northern part of the coastal forest nearly to sea level. It grows best on deep moist soils on slopes and sides of ravines with northern exposure.

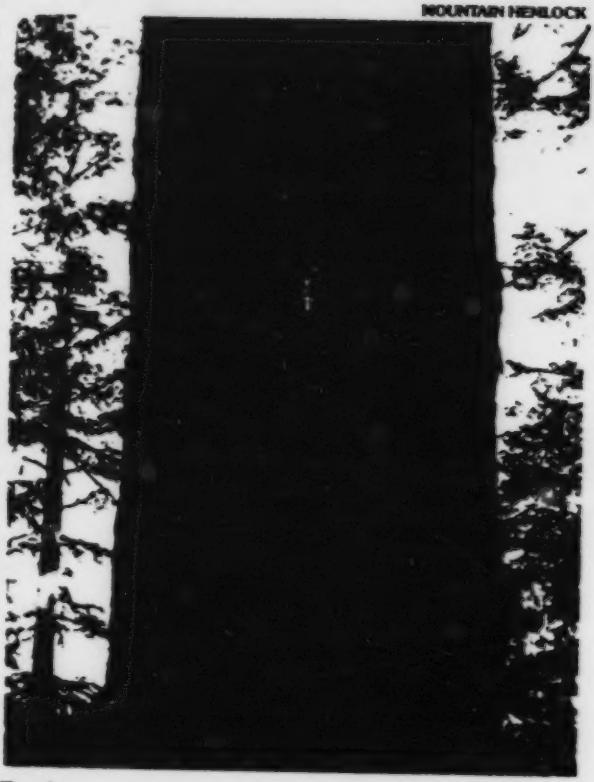
MOUNTAIN HEMLOCK

Cones

The cone is broad, cylindrical, 1-7 cm long, with scales slightly thickened, opening widely at maturity in the autumn, and becoming bent back towards the cone-base after shedding its seeds during winter.

Needles

The branches usually droop and often have ascending tips. The dark green needles are curved and thicker than those of the western hemlock and lack the white bands on the under surface. They are semi-circular in cross-section, equal length, about 2 cm long and blunt tipped.



Bark

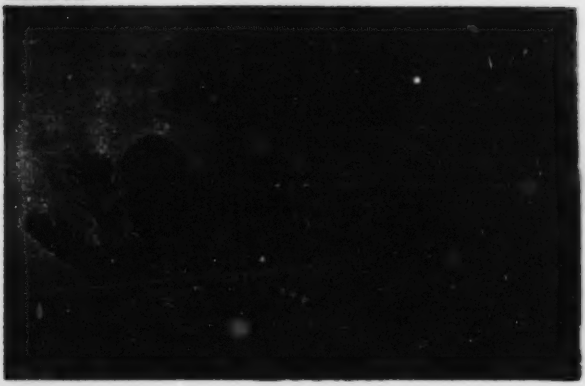
The bark is dark reddish-brown and is divided into hard, narrow, flat-topped ridges.

Grand Fir (Balsam) *Abies grandis*

On mature trees of this species, about 30-37 m high, the crown is cylindrical or oval in outline. The top of the crown is roundish or dome-like. The trunk, which is only slightly tapered, is long compared to the length of the crown and is usually clear of dead branches. On open-grown trees the trunk is completely hidden by branches that extend to the ground and, except on very old trees, the top of the crown is pointed. Its wood is light, soft, and relatively low in strength, being white to pale yellowish-brown. Of limited commercial importance, it is used for lumber, pulpwood, plywood, boxes, and crates. The tree was originally named 'Abies aromatica' because of the odour from its crushed needles.

Location

The grand fir is confined to low elevations on the south coast and southern interior. It grows best on deep, well-drained, alluvial soils where other species also thrive.



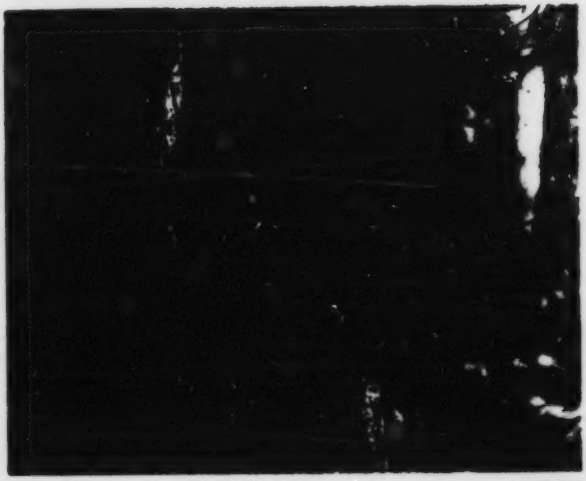
Cones

The buds are round, and the yellow-green cones, measuring 5-11 cm long, are borne erect at the top of the tree only.

Needles

The branches are generally horizontal, tend to bend downwards, but with up-turning tips. The flat, blunt needles, about 2-5 cm long, have a shiny dark green upper surface and a silvery underside. The needles are usually notched at their tips and spread in two distinct horizontal rows from the twig.

YOUNG



MATURE

Bark

The bark is smooth, greyish-brown, blotched with resin blisters and becomes scaly. On mature trees it is 5-8 cm thick and is broken into dark grey flat ridges.

Alpine Fir (Balsam) *Abies lasiocarpa*

Mature trees of this species attain heights of 20-33 m, and diameters of 30-75 cm, but, on exposed ridges at the timber line, it is often reduced to shrub size. In the open it grows extremely narrow and dense, with short branches that have a tendency to droop and extend down to the ground. When growing in the forest, the crown is narrowly conical with an elongated and extremely narrow top. The wood is light, soft and relatively low in strength and is used mainly for general construction and for pulp. The alpine fir is a favorite tree for squirrels who tear open the clusters of large cones when the seeds ripen in September.

Location

Alpine fir is a high altitude tree, growing at elevations ranging from 600-2 250 m. It grows best on well drained soils, in protected valleys at the heads of mountain streams. Usually mixed with other species, it may be found in pure stands.

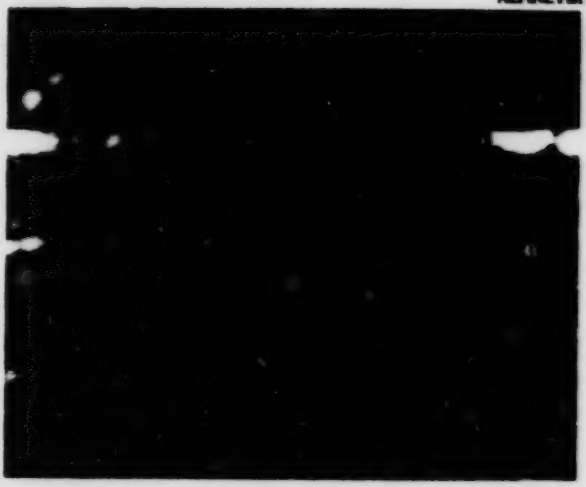
ALPINE FIR

Cones

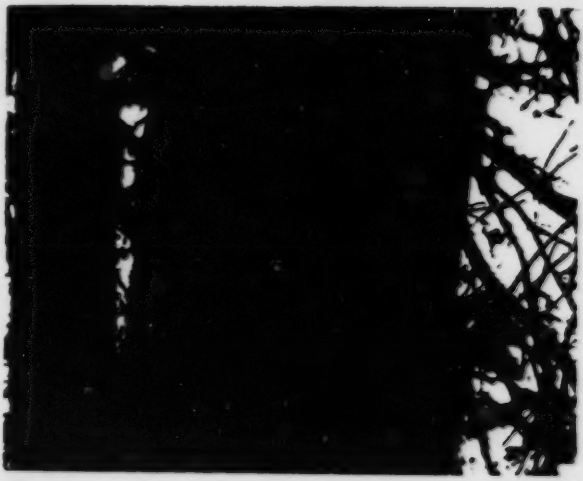
The cones, found only at the top of the tree, are 6-10 cm in length. When ripe they are a deep purple which gradually becomes lighter by the time the scales fall. The cones stand erect and during warm weather freqently drip with silvery resin. The ivory-brown seeds have large shiny, purplish, or violet-tinged wings.

Needles

The branches tend to droop and extend to the ground. The bluish-green needles, about 2 cm long, strongly curve upwards to give each bough a "brush-cut" appearance. The needles are rounded, and have notched tips.



YOUNG



MATURE

Bark

The bark is smooth, ash-grey, blotched with raised blisters when the tree is young, becoming broken into irregular greyish-brown scales as the tree matures.

Amabilis Fir (Balsam) *Abies amabilis*

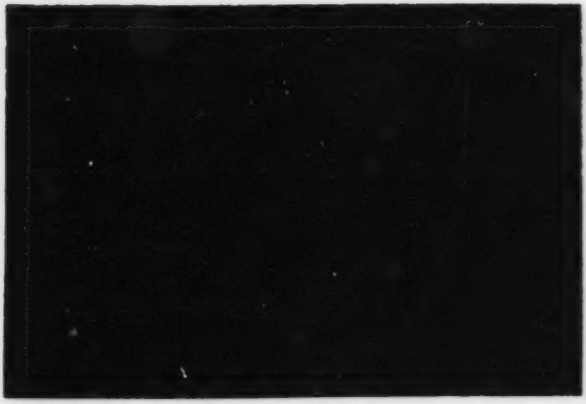
A large, but slender coastal tree found at medium elevations, balsam has a narrow conical crown and a long, gradually tapering top. Mature trees produce long slender trunks free of foliage for half or more of the tree's average height of 24-38 m. As with all firs, the needles are tolerant of shade and, since they remain on the branches for several years, the crown becomes quite dense. The wood is light, soft, low in strength, and creamy-white to yellowish-brown. It is used mainly for pulpwood, general construction and plywood. Because of the symmetrical shape of the young tree and its attractive, shiny foliage, it is sometimes planted as an ornamental.

Location

Amabilis fir grows on a variety of soils, occasionally in pure stands, but more often in mixture with other species. In wetter areas of the coast it is often a dominant tree.

Cones

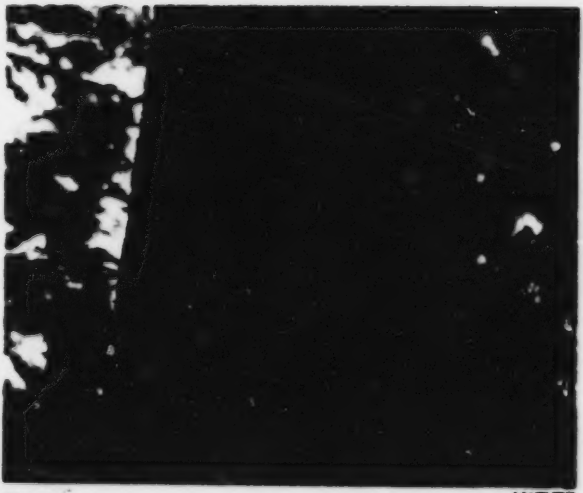
The cones, about 8-12 cm long, are purple and stand upright, and are found only at the top of the tree.



Needles

The branches droop, and because they are shed slowly by the tree, remain for several years, even after dying. The needles are dark green, blunt and often notched at the tip. The needles, about 2 cm long, appear more or less in three rows, with those on top pointing forward along the bough.

YOUNG



MATURE

Bark

The bark is smooth, pale grey, blotched with resin blisters, eventually turning scaly on old trees.

Broadleaf Maple *Acer macrophyllum*

Our largest native maple, this tree can reach a height of 36 m. In the forest the tree develops a narrow crown supported by a trunk free of branches for one-half or more of its length. Trees growing in the open have broad, rounded crowns supported by a few large spreading and ascending limbs low on the trunk, leaving only a small portion free of branches. The wood is moderately hard, not strong, and is light-brown in colour. Because of the limited supply of hardwoods in British Columbia this tree is of some local importance for furniture, musical instruments, interior panelling and other specialized uses.

Location

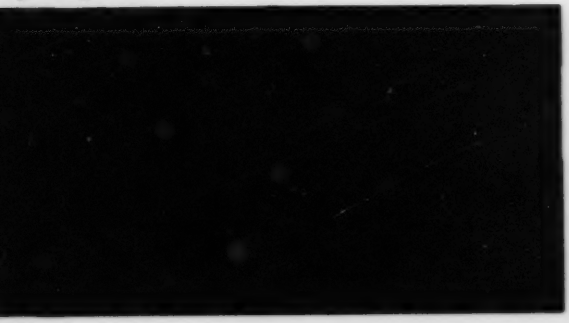
Broadleaf maple is confined to the southwest corner of British Columbia. It generally grows in coarse, gravelly, moist soils scattered among hardwoods and conifers. Occasionally it occupies clearings where it will later be succeeded by conifers.

BROADLEAF MAPLE

Fruit and Flowers

Small greenish-yellow flowers, about 3 mm across, appear early spring, hanging in clusters at the ends of twigs.

The fruit matures in the autumn, is 3-6 cm long with a swollen hairy seed. The seed wings are not spread very far apart.



Leaves

Side branches emerge in pairs from the main branches, as do the leaves from the twigs. The leaves are the largest of any Canadian maple, and the largest undivided leaf of any Canadian tree species, measuring 15-30 cm across, and almost as long. Deeply five-lobed, dark-green above, paler and without hairs on the underside, the leaves turn yellow in the autumn and its leaf-stalk exudes a milky sap when broken.

Bark

Matu
scaly
smoo

k

..e bark is greyish-brown, shallowly furrowed into
ridges, while the younger bark has a much
other appearance.

Trembling Aspen *Populus tremuloides*

Other than the willow, the trembling aspen is probably the most widespread deciduous tree throughout the interior of the Province. It is not a very large tree, averaging about 12 m in height and 20-25 cm in diameter, but sometimes reaches a height of 30 m in height and a diameter of 60 cm. The trunk is slender, has a gradual taper, and extends almost to the top of the tree. The round-topped crown is made up of moderately stout, generally ascending branches. The wood is light, soft, not strong and fine textured. Greyish-brown with almost white sapwood it is used for veneer, matches and boxes, and in the manufacture of excelsior and pulp.

Location

Trembling aspen grows best on a well-drained loam, but is commonly found on a wide variety of soils. It is intolerant of dense shade, and occurs most frequently in pure stands or mixed with other light-demanding species. Often the overlapping roots of nearby trees become grafted together. Like all poplars, it reproduces quickly and easily by means of root suckers.

TREMBLING ASPEN

Leaves

The branches are slender, and generally ascending. The leaves are nearly circular in outline, abruptly pointed, fine-toothed with rounded teeth, 4-8 cm long. They are carried on long, flattened stems which cause the leaves to tremble in the slightest breeze. The leaves are dark green above, yellowish-green below.

Fruit and Flower

Trembling aspen flowers in March and April before producing leaves. The flowers form from special buds and are unisexual—the male and female being on different trees. The flower is in the form of a drooping, hairy catkin. The fruit, which develops in May and June, just before the leaves are fully grown, is a greenish capsule about 6 mm long, arranged in catkins and containing small tufted seeds. It opens at maturity.

Bark

Smooth, greenish to yellowish-brown on young trees, the bark becomes rough, furrowed, and grey to brown as the tree matures.

Black Cottonwood *Populus trichocarpa*

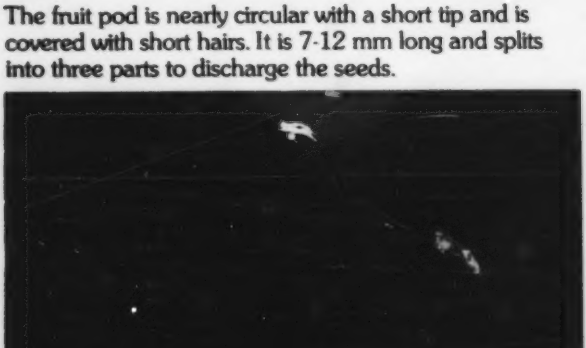
This is our largest native broadleaf tree, growing to heights of 24-38 m. It develops a straight cylindrical trunk with a narrow, but somewhat columnar crown. Its wood is light, soft, low in strength, greyish-brown with a nearly white sapwood. It is an important commercial tree throughout the Province as its logs produce wide boards of knot-free lumber used for furniture making, boxes, crates, veneer and plywood.

Location

Black cottonwood grows throughout British Columbia, and is usually confined to low-lying damp areas where it grows on loose, porous, gravelly or sandy soils. Pure stands can sometimes be found on river banks, but the tree is more often seen in mixture with other species having similar growth requirements.

Fruit

The fruit pod is nearly circular with a short tip and is covered with short hairs. It is 7-12 mm long and splits into three parts to discharge the seeds.



Leaves

Branches are generally short and stout. The leaves are triangular, 7-13 cm long, dark green above, silvery-green below and frequently stained with brownish resin blotches. The stalk is round in cross-section and can be rolled between thumb and forefinger.

BLACK COTTONWOOD

YOUNG

MATURE

Bark

On young trees the bark is smooth, yellowish-grey. This turns dark greyish-brown on mature trees and becomes furrowed into flat-topped ridges separated by irregular V-shaped crevices.

Red Alder *Alnus rubra*

This is the largest of the native alders. A medium sized tree, it may reach heights of 24 m and diameters of 30-60 cm. Short lived, it is old at 40 years, and seldom survives for more than 60 years. When growing in the forest it develops a straight, slightly tapered trunk extending to the top of a narrow rounded crown. In the open, the crown starts almost at the ground, and is composed of spreading branches which give the tree a broadly conical shape. The fine, even textured wood is a pale brown colour, often turning reddish after cutting. Red alder takes stain well, works easily, and is used for cabinet work, turnings, and novelties. The Indians used to extract red dye from the inner bark.

Location

Red alder is intolerant of shade and commonly grows in pure stands as an early occupant on cleared land. It is generally one of the first trees on burned or cutover areas—but does not survive long and is replaced by more tolerant species.

Fruit

The fruiting body is oval, 2 cm long by 1 cm wide. The nutlet is narrowly winged, or may have a wing encircling it.

Leaves

The leaves are darkish-green, oval to rhombic, distinctly serrated on the edges, and greyish beneath. The veins on the underside are a rusty red and hairy. Veinlets between the veins form a ladder-like pattern. The leaves are different from other deciduous trees because they remain green until they drop in the fall.

Bark

The outer part of the bark is a smooth greenish-grey while the inner part turns rusty-red shortly after exposure to the air.

White Birch *Betula papyrifera*

This is a variable species with numerous forms and several recognized varieties. A fairly small tree it grows up to 24 m in height and 60 cm in diameter. As a forest tree it normally has a slender trunk which often curves, before extending almost to the top of the narrowly oval, open crown. On open-grown trees the crown is pyramidal and comprises a greater part of the tree's height. The wood is moderately heavy, hard, strong, but not durable when in contact with the soil. It is used mainly for special products, turnery, pulpwood and veneer stock.

Location

White birch grows on a variety of soils, but does best on well-drained sandy or silty loams. Being intolerant of shade it thrives on burned-over and cut-over areas where it often forms pure stands. It has a thin inflammable bark and is easily killed by fire—but it can reproduce itself quickly by developing sprouts around the base of the trunk.

WHITE BIRCH

Fruit

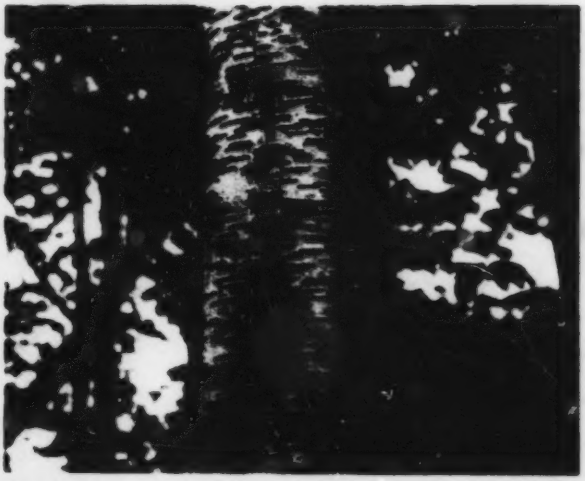
Narrow fruiting bodies about 35 mm long by 7 mm wide hang from the branches and are shed when ripe. The seed wings are much wider than the seed portion.

Leaves

Triangular or egg-shaped, the leaves are about 8 cm long, without teeth for about 12 mm on either side of the stalk. They are dull green above, paler with a soft down below.

WHITE BIRCH

YOUNG



MATURE

Bark

Thin, smooth, reddish-brown bark on young trunks becomes creamy-white. It peels easily into large sheets to expose a reddish-orange inner bark which turns black.

Western Flowering Dogwood

Cornus nuttallii

The floral emblem of British Columbia, the western flowering dogwood is only found on Vancouver Island and the adjacent mainland. The dogwood grows best on deep, coarse, well-drained soils, and is most noticable when in flower.

Appearing in April to June and sometimes again in September, the very small purple-green flowers are clustered together, encircled by four to six white bracts, which gives the cluster the appearance of a single flower with white petals.

The dogwood is a protected species, and it is unlawful to pick, cut, damage or destroy this unique tree.

Rhododendron *Rhododendron macrophyllum*

The rhododendron, a shrub 1-3 m high, has shiny evergreen leaves 10-15 cm long, and many rose coloured flowers in the spring.

Found usually at low elevations in Southern British Columbia, the rhododendron is also a protected species.

Trillium *Trillium ovatum*

The trillium is a most delicate flower found in rich deep soil in shaded damp forested areas on Vancouver Island and southern British Columbia mainland areas.

Blooming from the beginning of April through May, the pure white flower slowly turns pink then a wine-purple as it ages.

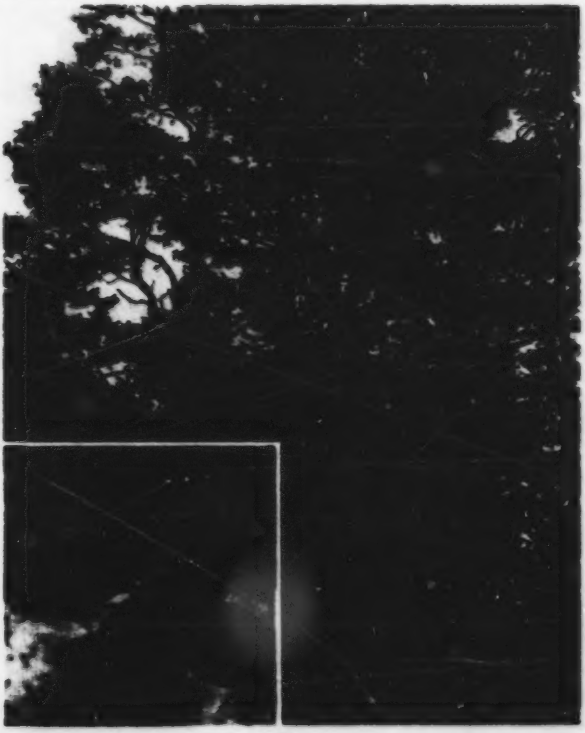
The trillium is also a protected species.

Arbutus *Arbutus menziesii*

The only broadleaved evergreen tree in Canada, the arbutus is easily recognized by this feature alone, particularly in winter.

Its dark glossy green leaves are 7-12 cm long, rounded at both ends, quite thick and have a leathery texture.

A scraggly tree, seldom more than 20 m high, the arbutus grows best on well-drained soils near sea level, but characteristically grows on exposed rocky bluffs overlooking the sea or a lake. Thin, smooth, reddish-brown arbutus bark, peels off in papery flakes and strips, exposing yellowish-green under-bark, which soon reddens.



Douglas Maple *Acer glabrum*

Douglas maple, is really a large shrub which under favourable conditions reaches heights up to 10 m. Found throughout southern British Columbia on bluffs, cliffs and ledges of rocky hills, it is easily recognized by its short trunk which divides into two or three slender limbs.

The dark green leaves, about 9-10 cm wide and the same in length are three-lobed (sometimes appearing five lobed) and turn bright red in the fall.

Vine Maple *Acer circinatum*

Vine maple has a short crooked trunk with several twisted, spreading branches. This small tree or shrub, often 10 m high, grows in water-formed soils along the banks of streams and is often found in moist soils. It may grow in clumps or patches, but is also found scattered among other species. The circular bright yellowish-green leaves, about 12 cm wide, normally have seven to nine lobes.

In autumn the leaves turn a bright red or orange. West Coast Indians carved spoons, bowls and other household utensils from this hard, close grained wood.

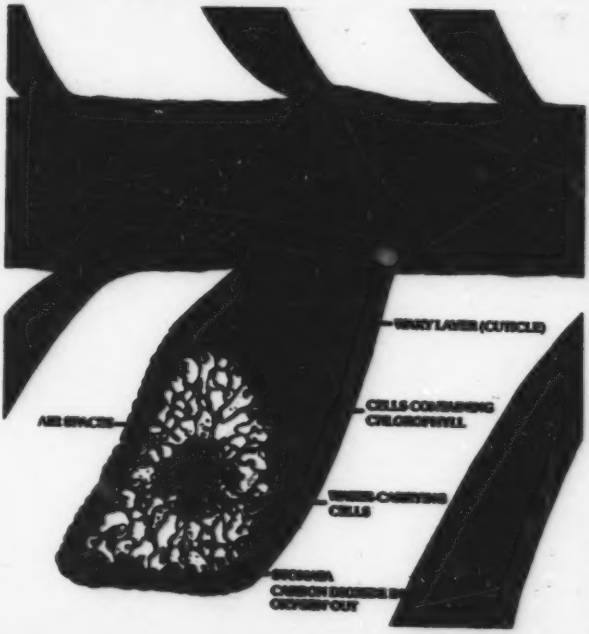
How a Tree Grows

Unlike people, trees do not grow from the bottom, but increase in height by growing up from their stem top and branch tips. Annual extension occurs only from these growing points. Similar to people, trees do experience annual growth outward. Together, these two growth habits give the tree its tapered form. The base of the tree is the oldest, has the greatest accumulation of annual diameter growth and is, therefore, the largest part of the tree.

Growth in diameter is most rapid early in the growing season, and the 'earlywood' produced at this time consists of large, light coloured cells. The 'latewood' cells produced later in the season are smaller with thicker walls and so appear to be darker. Each pairing of light and dark bands compose one 'annual ring' which marks another year in the life of the tree. In discussions of tree growth, the living systems are emphasized. Worn-out and dead cells are a part of the story as well. Old phloem cells become a part of the outer bark and the protection system of the tree. As xylem cells die they fill with resin and harden to become part of the heartwood—the strength and reinforcement centre of the tree. From seed, the tree builds itself into a self-sufficient factory. The roots anchor the tree to, and absorb water and minerals from, the soil. The leaves manufacture sugar from the raw materials of air and water. Special tissues such as xylem and phloem transport water, minerals and food to various parts of the tree. The trunk takes care of support, maintenance and tree repair. The tree is a dynamic living system offering many benefits to people, animals and our whole environment.

Needles

Needles manufacture the food or fuel that runs the total tree system. They do this through a process called photosynthesis, a chemical reaction carried out in the green 'chloroplast' cells. Driven by energy from the sun, water is broken down into hydrogen and oxygen elements, then recombined with carbon dioxide to form a simple sugar, and passed along to living cells to provide energy for their various activities. The excess oxygen is released into the atmosphere. Needles also house the breathing apparatus of the tree. Through tiny surface holes called 'stomata', the amount of air that enters and leaves the tree is controlled. Two 'guard cells' on either side of the stomata regulate the extent and duration of the opening, to obtain the amount of carbon dioxide needed for photosynthesis without permitting too much water to evaporate.



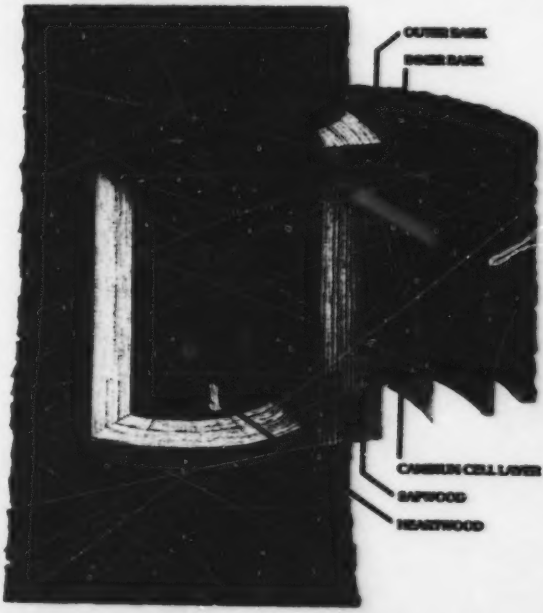
Trunk

If you were to unravel a tree, layer by layer, you would discover five layers each with a separate function . . . The OUTER BARK protects the tree from injuries, insects and disease, and insulates against cold and heat.

The INNER BARK, or "Phloem", is the pipeline which carries food made in the leaves down to the branches, trunk and roots. It lives for only a short time, then dies to become part of the outer bark.

The CAMBIUM CELL LAYER is the growing part of the trunk. Each year it produces new inner bark on the outside, and new sapwood on the inside.

SAPWOOD carries water and dissolved minerals from the roots up to the leaves. As new outside layers of sapwood are added, the old inside layers die and become heartwood. The HEARTWOOD, though dead, gives the tree its strength.



Roots

A tree's root system serves two functions—anchoring the tree to the earth and absorbing water and mineral food materials from the soil. The first is performed by the entire root system, the second is restricted to the root tips. Development of the root system is proportional to development of the trunk and crown; the larger the tree, the greater the need for an extensive support and water supply system.

Just as the tree benefits from its root system, so does the soil. The horizontal and vertical branching of the roots holds the soil in place and protects it from erosion. The roots also create new pathways for animals, insects and worms that enrich the soil.

Root tips have a protective cell layer guarding the sensitive absorptive tissue from direct contact with the earth. A slippery coating on the outside of the 'root cap' helps the advancing root tip slide through the soil. Close behind the protective cap are many tiny single-celled root hairs. These root hairs penetrate between soil particles to absorb water and dissolved nutrients. The root tips act as feelers for the root system, moving forward into the soil in search of water and minerals. The main roots form the back-up system as they lengthen and expand to increase the surface area for absorption.

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Metric System Equivalents

Temperature	
Fahrenheit	Celsius
212	100
98.6	37
68	20
50	10
32	0
14	−10
−4	−20
−40	−40

Length Measurements	
1 in	2.54 cm
1 ft	0.30 m
1 yd	0.91 m
1 mi	1.61 km
1 mm	0.04 in
1 cm	0.39 in
1 m	3.28 ft
1 km	0.62 mi

Mass Measurements	
1 oz	28.35 g
1 lb	0.45 kg
1 cwt	45.36 kg
1 ton	0.91 t
1 g	0.04 oz
1 kg	2.20 lb
1 kg	0.02 cwt
1 t	1.10 ton

Liquid Volume	
1 fl/oz	28.41 ml
1 pt	0.57 litre
1 qt	1.14 litre
1 gal Can	4.55 litres
1 ml	0.04 fl/oz
1 litre	1.76 pt
1 litre	0.88 qt
1 litre	0.22 gal Can

Canada

BC

Partnership Agreement on Forest Resource Development: FRDA II